

CLAIMS

1. A hand held electrically powered tool, comprising:
 - a drive mechanism of the tool;
 - a gear casing for housing the drive mechanism, the gear casing including an entrance;
 - a motor including an armature shaft having a first end at which a pinion is formed for engaging the drive mechanism;
 - a motor plate having a central opening mounted around the armature shaft adjacent said first end;
 - an armature shaft bearing including an outer race and located between the motor plate and the pinion, and received in the entrance of the gear casing;
 - a resilient O-ring located on the motor plate and engaging the outer race of said bearing;
 - and
 - a resilient sealing ring moulded onto the motor plate and located around the central opening through the motor plate for sealing between the motor plate and the armature shaft.
2. A tool according to claim 1 wherein the resilient O-ring is moulded directly onto the motor plate.
3. A tool according to claim 1 wherein the motor is housed in a motor housing and the motor plate is sandwiched between the motor housing and the bearing when the motor is fixed with respect to the gear casing.
4. A tool according to claim 1 wherein fixing members, pass through receiving holes in the gear casing and the motor housing and through recesses in the motor plate for fixing the motor with respect to the gear casing.
5. A tool according to claim 1 wherein the resilient sealing ring has a first portion which is moulded onto the motor plate and a second portion which depends from the first portion and forms a seal against the armature shaft.
6. A tool according to claim 5 wherein the first portion has an L-shaped radial cross-section and the second portion has a V-shaped radial cross-section and depends from the outside corner of the L-shaped portion.

7. A tool according to claim 1 wherein the motor plate is located adjacent a fan, which fan is mounted to rotate with the armature shaft, so that the plate forms part of a chamber for the fan and through holes are formed in the motor plate which act as inlets to the fan.
8. A tool according to claim 1 wherein the resilient O-ring is supported on its radially outer surface by a surface of the entrance to the gear casing.
9. A hand held electrically powered tool, comprising:
 - a drive mechanism of the tool;
 - a gear casing for housing the drive mechanism, the gear casing including an entrance;
 - a motor including an armature shaft having a first end at which a pinion is formed for engaging the drive mechanism;
 - a motor plate having a central opening mounted around the armature shaft adjacent said first end;
 - an armature shaft bearing including an outer race and located between the motor plate and the pinion, and received in the entrance of the gear casing;
 - a metal ring defining a hole and located within the central opening of the motor plate; and
 - a resilient sealing ring moulded onto the metal ring and located around the hole through the metal ring for sealing between the metal ring and the armature shaft.
10. A tool according to claim 9 and further comprising a resilient O-ring moulded on the metal ring and engaging the outer race of the bearing.
11. A tool according to claim 9 wherein the metal ring has an axially extending portion and the resilient sealing ring includes a first portion moulded over the axially extending portion and a second portion which depends from the first portion and forms a seal against the armature shaft.
12. A tool according to claim 11 wherein the first portion of the resilient sealing ring has a U-shaped radial cross-section and the second portion has a V-shaped radial cross-section and depends from the radially inner corner of the U-shaped portion.

13. A tool according to claim 10 wherein the metal ring has a radially outwardly extending portion and the resilient O-ring is moulded to a face of the radially extending portion.

14. A sub-assembly for a motor of a hand held electrically powered tool comprising an armature shaft having a first end at which a pinion is formed, a motor plate having a central opening mounted around the armature shaft adjacent said first end and a first armature shaft bearing located between the motor plate and the pinion, characterised in that a moulded on resilient sealing ring is located around the central opening through the motor plate for sealing between the motor plate and the armature shaft and a moulded on resilient O-ring is located on the face of the motor plate facing the bearing for engaging the outer race of said bearing.

15. A sub-assembly according to claim 14 wherein the resilient sealing ring is moulded directly onto the motor plate.

16. A sub-assembly according to claim 14 wherein the resilient O-ring is moulded directly onto the motor plate.

17. A sub-assembly according to claim 14 wherein the resilient sealing ring and the resilient O-ring are moulded onto a metal ring which metal ring fits within the central opening of the motor plate.

18. A sub-assembly according to claim 14, additionally including a fan mounted on the armature shaft to rotate with the shaft, and wherein the motor plate is located adjacent the fan so that the plate forms part of a chamber for the fan and through holes are formed in the motor plate which act as inlets to the fan.